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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/536,704

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EXAMINER

WALFORD, NATALIE K

ART UNIT

PAPER NUMBER

2879

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/536,704	Applicant(s) TAKEUCHI ET AL.	
	Examiner NATALIE K. WALFORD	Art Unit 2879	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 December 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3,5,6 and 8-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,3,5,6 and 8-12 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2005 and 22 November 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

The Amendment, filed on December 29, 2008, has been entered and acknowledged by the Examiner. Newly added claims 10-12 has been entered. Claims 1, 3, 5-6, and 8-12 are pending in the instant application.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 12 is rejected under 35 U.S.C. 102(b) as being anticipated by Nagayama et al. (US 5,742,123).

Regarding claim 12, Nagayama discloses in a metal halide lamp having a pair of electrode structures mounted for providing electrodes in figure 1, the improvement comprising; an arc tube of a translucent polycrystalline alumina ceramic (item 1F) having magnesium oxide of 200 ppm or below (column 10, line 66 thru column 11, line 3), and containing a discharge space in which the electrodes (item 3) of the electrode structures are located to oppose each other wherein the following equation is satisfied, $0.5 \leq G \leq 1.5$ (column 16, lines 9-25) wherein an average crystal grain diameter in the translucent polycrystalline alumina ceramic arc tube is $G(\mu\text{m})$ and is calculated by measuring the number of crystals grains per unit length of the arc

Art Unit: 2879

tube extending in a direction between the electrodes and dividing the unit length by the number of crystal grains (Nagayama; column 11, lines 10-47).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 5-6, and 8-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keijser et al. (US 6,300,729) in view of Nagayama et al. (US 5,742,123).

Regarding claim 1, Keijser discloses a metal halide lamp in figures 1 and 2 comprising an arc tube (item 1) that includes: a pair of electrode structures, each of which has an electrode (items 4 and 5) at a tip (items 4b and 5b); a main tube part (item 3) made of ceramic (column 3, lines 7-9), and containing a discharge space (item 11) in which the electrodes of the electrode structures are located to oppose each other; and a pair of thin tube parts (items 34 and 35) that connect from the main tube part and are sealed by respective sealing members (item 10) with the electrode structures inserted therein, wherein $20 \leq WL \leq 50$ and $EL/Di \geq 2.0$ are satisfied (column 4, lines 41-43), where tube wall loading of the arc tube is $WL(W/cm^2)$, a distance between the electrodes is $EL(mm)$, an inner diameter of the main tube part is $Di(mm)$, but does not expressly disclose that the ceramic is sintered polycrystalline alumina having magnesium oxide of 200 ppm or below and that $0.5 \leq G \leq 1.5$ is satisfied, where an average crystal grain diameter of the polycrystalline alumina ceramic is $G(\mu m)$, as claimed by Applicant. Nagayama is cited to show

Art Unit: 2879

a lamp in figure 1 with a tube part (item 1F) that is made from sintered polycrystalline alumina have an average crystal grain diameter between 0.7 and 1.4 microns (column 16, lines 9-25). Also the tube part has magnesium oxide of 100 ppm (column 10, line 66 thru column 11, line 3). Nagayama teaches that this particular diameter of the grain can increase transmittance and diffuse less light (column 11, lines 36-47) and the MgO of this value produces no grain boundary phase (column 11, lines 1-7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Keijser's invention to include the ceramic is polycrystalline alumina having magnesium oxide of 200 ppm or below and that $0.5 \leq G \leq 1.5$ is satisfied, where a crystal grain diameter of the polycrystalline alumina ceramic is $G(\mu\text{m})$ as suggested by Nagayama for diffusing less light, increasing transmittance, and producing no grain boundary phase.

Regarding claim 3, the combined reference of Keijser and Nagayama disclose the metal halide lamp of Claim 1, wherein the inner diameter $D_i(\text{mm})$ of the main tube part satisfies $2.0 \leq D_i \leq 10.0$ (Keijser; column 4, lines 41-42).

Regarding claim 5, the combined reference of Keijser and Nagayama disclose the metal halide lamp of Claim 1, wherein the polycrystalline alumina ceramic has transmittance of 94% or more (Nagayama; column 10, lines 20-26).

Regarding claim 6, Keijser discloses a metal halide lamp in figures 1 and 2 comprising an arc tube (item 1) that includes: a pair of electrode structures, each of which has an electrode (items 4 and 5) at a tip (items 4b and 5b); a main tube part (item 3) made ceramic (column 3, lines 7-9), and containing a discharge space (item 11) in which the electrodes of the electrode

Art Unit: 2879

structures are located to oppose each other; and a pair of thin tube parts (items 34 and 35) that connect from the main tube part and are sealed by respective sealing members (item 10) with the electrode structures inserted therein, wherein $20 \leq WL \leq 50$ and $EL/Di \geq 2.0$ are satisfied (column 4, lines 41-43), where tube wall loading of the arc tube is $WL(W/cm^2)$, a distance between the electrodes is $EL(mm)$, an inner diameter of the main tube part is $Di(mm)$, but does not expressly disclose that the ceramic is sintered polycrystalline alumina having magnesium oxide in a range of 1 ppm to 200 ppm and $0.5 \leq G \leq 1.5$ is satisfied, where an average crystal grain diameter of the polycrystalline alumina ceramic is $G(\mu m)$, as claimed by Applicant. Nagayama is cited to show a lamp in figure 1 with a tube part (item 1F) that is made from sintered polycrystalline alumina have an average crystal grain diameter between 0.7 and 1.4 microns (column 16, lines 9-25). Also the tube part has magnesium oxide of 100 ppm (column 10, line 66 thru column 11, line 3). Nagayama teaches that this particular diameter of the grain can increase transmittance and diffuse less light (column 11, lines 36-47) and the MgO of this value produces no grain boundary phase (column 11, lines 1-7).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to modify Keijser's invention to include the ceramic is polycrystalline alumina having magnesium oxide of 200 ppm or below and that $0.5 \leq G \leq 1.5$ is satisfied, where a crystal grain diameter of the polycrystalline alumina ceramic is $G(\mu m)$ as suggested by Nagayama for diffusing less light, increasing transmittance, and producing no grain boundary phase.

Art Unit: 2879

Regarding claim 8, the combined reference of Keijser and Nagayama disclose the metal halide lamp of Claim 6, wherein the inner diameter $D_i(\text{mm})$ of the main tube part satisfies $2.0 \leq D_i \leq 10.0$ (Keijser; column 4, lines 41-42).

Regarding claim 9, the combined reference of Keijser and Nagayama disclose the metal halide lamp of Claim 1, wherein the polycrystalline alumina ceramic has transmittance of 94% or more (Nagayama; column 10, lines 20-26).

Regarding claim 10, the combined reference of Keijser and Nagayama disclose the metal halide lamp of Claim 1 wherein the average crystal grain diameter is measured, in the sintered polycrystalline alumina ceramic arc tube, by measuring a number of crystals per unit length of the arc tube extending in a direction between the electrodes and dividing the unit length by the number of crystals (Nagayama; column 11, lines 10-47).

Regarding claim 11, the combined reference of Keijser and Nagayama disclose the metal halide lamp of Claim 6 wherein the average crystal grain diameter is measured, in the sintered polycrystalline alumina ceramic arc tube, by measuring the number of crystals per unit length of the arc tube extending in a direction between the electrodes and dividing the unit length by the number of crystals (Nagayama; column 11, lines 10-47).

Response to Arguments

Applicant's arguments with respect to claims 1, 3, 5-6, and 8-9 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Art Unit: 2879

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Laska et al. (US 4,169,875) is cited to show a method of producing a tubular body of polycrystalline alumina.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalie K. Walford whose telephone number is (571)-272-6012. The examiner can normally be reached on Monday-Friday, 8 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571)-272-2457. The fax phone number for the organization where this application or proceeding is assigned is (571)-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

nkW

Application/Control Number: 10/536,704

Page 8

Art Unit: 2879

/Natalie K Walford/

Examiner, Art Unit 2879

/NIMESHKUMAR D. PATEL/

Supervisory Patent Examiner, Art Unit 2879